

REMARKS

Claims 1 to 22 are all the claims pending in the application, prior to the present Amendment.

The Examiner has indicated that claims 3 to 7 have been allowed. Applicant has added a new dependent claim 23 which depends from claim 3. The recitations of claim 23 can be found in claim 2, which has been canceled. The amendments to claim 3 have been made for the sake of consistency of claim language with new claim 23.

Claims 8 to 12 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent 4,582,535 to Buschow.

Applicant submits that Buschow does not disclose or render obvious the subject matter of claims 8-12 and, accordingly, requests withdrawal of this rejection.

The present invention, as set forth in claim 8, is directed to a rare earth (RE)-containing alloy which is obtained through the method of any one of claims 3-4.

Claim 9 is directed to an RE-containing alloy represented by formula $R(T_{1-x}A_x)_{13-y}$, and which comprises an R-rich phase and an R-poor phase wherein the R-rich phase and the R-poor phase are dispersed at a phase spacing of 0.01 to 100 μm .

Claim 10 is directed to an RE-containing alloy represented by the formula $R(T_{1-x}A_x)_{13-y}$ wherein the alloy has an NaZn_{13} phase content of at least 90 volume %.

The Examiner has stated that the present claims differ from Buschow in that Buschow is silent with respect to the crystal structure recited in the present claims, and that Buschow does not teach the process recited in the product-by-process claim 8.

The Examiner has asserted that the invention as set forth in claims 8-12 would have been obvious because the example alloys in Buschow have compositions that are encompassed by the present claims, and that the example alloys in Buschow would be expected to possess all the same properties as recited in the present claims.

As applicant set forth in the Amendment Under 37 C.F.R. § 1.111 filed on July 28, 2008, the mere fact that the alloy compositions of Buschow have compositions that are within the scope of the formula of the present claims does not mean that the alloys, in fact, are the same. As discussed in the present specification, and as can be seen from the examples therein, alloys that have the exact same composition, but produced by different methods, have different properties and are not the same.

Thus, Example 1 of the present specification discloses the production of an $\text{La}(\text{Fe}_{0.88}\text{Si}_{0.12})_{13}$ alloy produced by a strip casting method, in which the alloy was rapidly quenched with a cooling rate in the temperature range of 1600-900°C of about 1×10^3 °C/sec. The thus produced alloy strip sample was found to have a minute metallurgical microstructure in which an R-rich phase had a size of 5 μm or less and an R-poor phase had a size of 10 μm or less. The alloy of Example 1 is converted into an alloy having an NaZn_{13} phase content of at least 90 volume % after heat treatment at 1100°C for 3 hours.

In contrast, in Comparative Example 1, a molten alloy having the same composition as in Example 1 was prepared, except that the alloy was produced through a book mold method in which the alloy was allowed to stand for three hours for cooling to 50°C. As a result, as set forth in Comparative Example 1, the alloy produced through the book mold method had a considerably coarse alloy microstructure as compared with that of the alloy of Example 1

produced through rapid quenching. In addition, the alloy of Comparative Example 1 included three or more phases. That is, it had an R-rich phase, an R-poor phase, and one or more other phases which do not belong to the R-rich phase and R-poor phase, with each phase having a size of 100 μm or more.

After heat treatment at 1100°C for 3 hours, the alloy of Comparative Example 1 does not convert into a structure having more than 90 volume % of NaZn_{13} because a considerable amount of other phases are present, and it was confirmed that removing the undesired phase requires a long-period heat treatment. As disclosed in Comparative Example 1, the undesired phase was found to remain after heat treatment of 1100°C for 100 hours.

As described above, according to claim 8 of the present application, it is possible to obtain an alloy, in which a fine R-rich phase and a fine R-poor phase are homogeneously dispersed, and it is an effect of claim 8 that the period of heat treatment can be reduced.

Buschow neither discloses the cooling rate, nor the effect of claim 8 that the period for heat treatment can be reduced.

In Buschow, the alloy is produced by forming a melt from the required starting components, cooling the melt, and subjecting the resulting molding to a temperature treatment at a temperature in the range of from 800 to 1,000°C, succeeded by accelerated cooling to room temperature. Buschow does not disclose the specific method for forming the melt, and does not disclose any of the conditions for cooling the melt. As can be seen from Example 1 and Comparative Example 1 as discussed above, the cooling conditions that are employed will result in different products. Since Buschow does not disclose the cooling conditions for his alloy,

applicant submits that Buschow does not disclose or suggest the alloy set forth in claim 8, which requires the specific cooling conditions.

With respect to claim 8, the Examiner states in the present Office Action that he is not persuaded by applicant's argument that Example 1 and Comparative Example 1 of the present specification show that the cooling rate produces a different microstructure.

The Examiner asserts that the alloy composition in Example 1 is only one example of the alloy composition recited in claim 8. The Examiner argues that Example 1, therefore, is not commensurate in scope to claim 8 and, therefore, cannot support the patentability of claim 8. The Examiner refers to MPEP §716.02(d) in support of his position. The Examiner asserts that a general superiority cannot be inferred from the results obtained using a single embodiment of the claimed invention.

In response, applicant submits that the Examiner has misapplied the law. Accordingly, applicant continues to rely on Example 1 and Comparative Example 1 with respect to claim 8.

In particular, MPEP §716.02(d) relates to the situation where an applicant is relying on "unexpected results" to support the patentability of a claim. However, applicant is not relying on Example 1 to support a showing of unexpected results.

Instead, applicant is relying on Example 1 and Comparative Example 1 to show that the cited prior art to Buschow does not inherently obtain the alloy of claim 8. In setting forth the rejection of claims 8 to 12 in Paragraph 3 of the Office Action, the Examiner quotes, at page 3, from the case of *In re Best*. This case states that a "*prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed

product”. Applicant is relying on Example 1 and Comparative Example 1 of the present specification to show that the Buschow products do not necessarily possess the characteristics of the claimed product. Applicant is not relying on these examples to establish unexpected results.

Accordingly, applicant submits that Buschow does not disclose or suggest the subject matter of claim 8.

With respect to claim 9, and as applicant sets forth in the Amendment Under 37 C.F.R. § 1.111 filed on July 28, 2008, Buschow does not disclose or suggest the alloy of claim 9 which has a phase spacing of 0.01 to 100 μm for the dispersing of the R-rich phase and the R-poor phase. Again, as can be seen from Example 1 and Comparative Example 1, the use of different conditions results in alloys having different phase spacings. As set forth in the present specification at page 7, lines 4 to 9, the size of the R-rich phase and the size of the R-poor phase are equivalent to the phase spacing of these phases. Example 1 and Comparative Example 1 show that the sizes of the R-rich phase and R-poor phase that did not employ the cooling method of the present invention did not achieve the phase spacing set forth in claim 9.

With respect to claim 9, and applicant’s reliance on Example 1 and Comparative Example 1 to show that the use of different conditions results in different phase spacing, the Examiner states that he disagrees because the present specification at page 27, paragraph 2, at the end of Example 1, states that according to the present invention, a dispersed phase spacing of 0.01 to 100 μm “can be” produced.

The Examiner states that in view of the use of the phrase “can be”, this passage is not considered as a disclosure of the actual phase spacing obtained in Example 1, but rather is considered to be a phase spacing that “may” be attained by the present invention.

In response, applicant submits that the Examiner has not correctly analyzed the disclosure of Example 1. At page 26, last paragraph, Example 1 specifically states that the R-rich phase “had a size of 5 μm or less” and that the R-poor phase “had a size of 10 μm or less.” These sizes are the phase spacing of Example 1.

Further, the last paragraph of Example 1 that the Examiner quotes is a general statement of the phase spacing that can be achieved by the present invention, and is not a statement of the specific phase spacing that was achieved in Example 1. Applicant notes that in the Amendment Under 37 C.F.R. § 1.111 that was filed on July 28, 2008, it was stated at page 9, last line to page 10, line 1, that the phase spacing in Example 1 was 0.01 to 100 μm , but this statement was in error. The present specification clearly states at page 6, lines 16 and 17, and then again at page 12, last line to page 13, line 1 that the phase spacing is 0.01 to 100 μm . These statements disclose the range for the phase spacing of the present invention.

The Examiner also relies on the MPEP §716.02(d) to argue that Example 1 is not commensurate in scope with claim 9. As discussed above, applicant submits that the Examiner’s reliance on this section of the MPEP is misplaced because applicant is relying on the examples to show that Buschow does not inherently obtain the alloy of claim 9.

Turning now to claim 10, applicant refers the Examiner to Example 2 and Comparative Example 2 of the present specification. Example 2 and Comparative Example 2 differed in the

cooling rates, but both produced an alloy having the same composition, namely, an $\text{La}(\text{Fe}_{0.89}\text{Si}_{0.11})_{13}$ alloy. The alloy of Example 2 was produced by strip casting, as was the alloy of Example 1 where the cooling rate was $1 \times 10^{30^\circ}\text{C/sec}$ as measured within the range of the temperature of the molten alloy to 900°C . The cooling rate of Comparative Example 2 in the same temperature range was less than 100°C/sec .

In Example 2, the amount of NaZn_{13} structure was 93 mass%, whereas in Comparative Example 2, after the same sintering and heat treatment as in Example, was 54 mass%. Since Buschow does not disclose the cooling rates and the amount NaZn_{13} structure, one of ordinary skill in the art would not have any reason to believe that Buschow would attain an alloy with an NaZn_{13} phase content of at least 90 mass %.

With respect to claim 10 and applicant's reliance on Example 2 and Comparative Example 2 to show that the use of different rates results in alloys having different amounts of the NaZn phase, the Examiner states that Example 2 is only one example of the alloy composition recited in claim 10. The Examiner again relies on MPEP §716.02(d).

As discussed above, applicant submits that the Examiner's reliance on MPEP §716.02(d) is misplaced because applicant is relying on the examples to show that Buschow does not inherently obtain the alloy of claim 10. Accordingly, applicant submits that claim 10 is not disclosed or suggested by Buschow.

In view of the above, applicant submits that Buschow does not disclose or render obvious the subject matter of claims 8-12 and accordingly requests withdrawal of this rejection.

Claims 1 and 2 have been rejected under 35 U.S.C. § 103(a) as obvious over the Fujita et al article.

Applicant has canceled claims 1 and 2. Accordingly, this rejection is moot.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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